HP NC7170 Dual Port PCI-X 1000T Gigabit Server Adapter User Guide

June 2007 (Second Edition)
Part Number 331899-00B

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About This Guide

This guide can be used for reference when installing HP NC7170 Dual Port PCI-X 1000T Gigabit Server Adapters.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Technician Notes

WARNING: Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repairs specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Disconnect power from the system by unplugging all power cords from the power supplies.**
- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in.) of clearance at the front and back of the server.

CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

Where to Go for Additional Help

HP updates networking software frequently to include new functionality and features. Complete the following steps to get the latest drivers, firmware, and documentation.

1. Go to the HP website (http://www.hp.com).
2. Click **Support and Troubleshooting Information** from the left menu bar.
3. Type the product name in the **for product** box and press **Enter**. For example, type NC370T.
4. Download the drivers, firmware, or documentation as needed.

Telephone Numbers

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For HP technical support:

- In the United States and Canada, call 1-800-652-6672.
- Outside the United States and Canada, refer to

  www.hp.com

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Introduction

Overview

The HP NC7170 Dual Port PCI-X 1000T Gigabit Server Adapter is a high-performance, stand-alone Ethernet adapter with a single, integrated, dual port controller chip that delivers up to 1000 Mb/s Ethernet over twisted-pair (copper) cabling. For best performance, install the adapter in a 64-bit/133 MHz, PCI-X slot. The NC7170 Gigabit Server Adapter is a supported option for selected HP ProLiant servers.

For the latest functionality, features, and operating system support for this server adapter, refer to the networking page at

(http://h18004.www1.hp.com/products/servers/networking/index-nic.html)

Hardware Overview

The HP NC7170 Dual Port PCI-X 1000T Gigabit Server Adapter has two auto-negotiating 10/100/1000 RJ-45 ports. LED indicators show activity/link and port speed. The adapter supports current standards for system manageability and power management, such as Advanced Configuration and Power Interface (ACPI) and Advanced Power Management (APM). Refer to Table 1-1 for descriptions of LED operations.

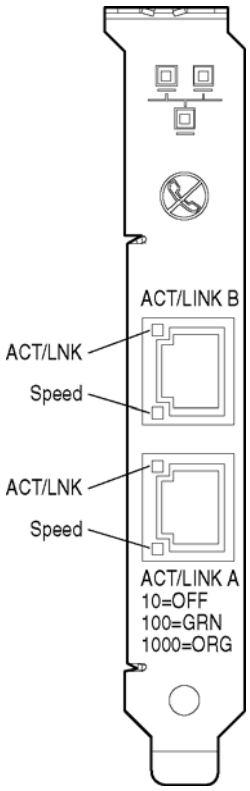

Figure 1-1: NC7170 Gigabit Server Adapter

LED Indicators

The NC7170 Gigabit Server Adapter LED indicators operate as described in the following table.

Table 1-1: LED Operations for the NC7170 Adapter

LED	Status	Description
ACT/LINK	On	Link to the adapter is established. The adapter is receiving power and the cable connection is good.
	Off	No link to the adapter is established. The adapter is not receiving power or the cable connection is faulty.
	Flashing	The adapter is sending or receiving network data at 10/100/1000 Mb/s, as indicated by the 10/100/1000 (speed) LED. The adapter is receiving power, and the cable connection is good.
Speed	Off	The adapter is sending or receiving network data at 10 Mb/s.
	Green	The adapter is sending or receiving network data at 100 Mb/s.
	Orange	The adapter is sending or receiving network data at 1000 Mb/s.

UTP Category 5 Cable

The NC7170 Gigabit Server Adapter can use existing Category 5 (or better) cable to deliver Gigabit Ethernet over copper, according to the IEEE 802.3ab specifications. For new installations, Category 5e cable is recommended. For troubleshooting and other information about cabling, refer to “UTP Cable Specifications” in Appendix C.

2

Installing the Adapter

Overview

This chapter describes installation precautions, how to install the adapter, and how to attach the fiber network cable.

WARNING: To avoid the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with your equipment before attempting installation of the adapter.

Many servers are capable of producing energy levels that are considered hazardous. Users should not remove enclosures, nor should they bypass the interlocks provided for removal of these hazardous conditions.

Installation of this adapter should be performed by individuals who are both qualified in the servicing of computer equipment, and trained in the hazards associated with products capable of producing hazardous energy levels.

NOTE: Before removing the cover of your server, refer to the HP documentation for the proper methods for installing a PCI card and avoiding electric shock hazards.

Electrostatic Discharge Precautions

A discharge of static electricity from a finger or other conductor can damage components on the adapter. This can make the adapter inoperable. In addition to the following information, refer to Appendix B for more precautions.

To prevent electrostatic damage, observe the following precautions:

- Always properly ground yourself when touching a static-sensitive component or assembly.
- Avoid hand contact by transporting and storing parts in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free locations.
- Place containers on a grounded surface before removing the contents.
- Avoid touching pins, leads, or circuitry.

Installing the Adapter in a Server

Refer to the HP ProLiant server documentation for additional information on how to safely install a PCI card in the server.

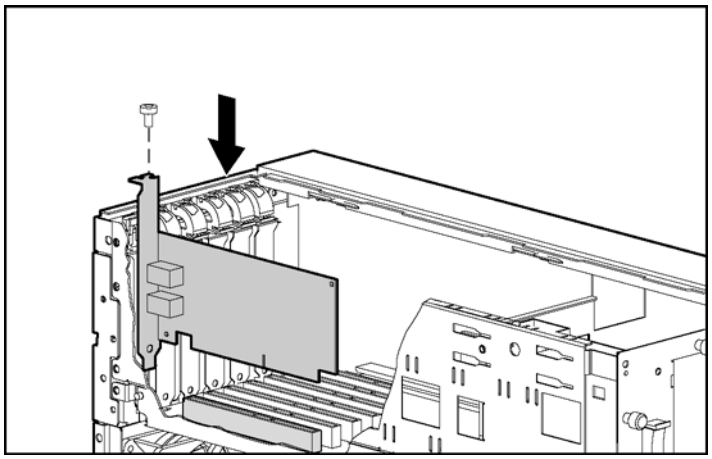

Figure 2-1: Installing the adapter in a server

WARNING: If the server is not PCI Hot Plug compliant, power it down and unplug the power cord from the power outlet before removing the server cover. Failure to do so may damage the adapter or server.

1. Remove the power cord and server cover. Then remove the cover bracket from a PCI/PCI-X slot.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

2. Firmly seat the adapter in a PCI/PCI-X slot and secure the adapter bracket.
3. Replace the server cover and plug in the power cord.

Connecting the Network Cable

Network connections for the NC7170 Gigabit Server Adapter can employ existing UTP Category 5 (or better) cable for Gigabit over copper transmissions. For new installations, Category 5e (enhanced Category 5) or better cable is recommended.

To secure the cable, plug the cable connector into the RJ-45 port. Ensure that the tab on the plug clicks into position indicating that it is properly seated.

For more information, refer to “UTP Cable Specifications” in Appendix C.

A

Regulatory Compliance Notices

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Declaration of Conformity for Products Marked with the FCC Logo – United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Hewlett-Packard Company
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or call 1-800-652-6672. (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

or call (281) 514-3333.

To identify this product, refer to the Part, Series, or Model number found on the product.

Canadian Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

CE

Products with the C0E Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22) – Electromagnetic Interference
- EN55024 (IEC61000-4-2,3,4,5,6,8,11) – Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2) – Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) – Power Line Flicker
- EN60950 (IEC950) – Product Safety

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japanese Notice

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Korean Notice

사용자 안내문 : B 급 기기

이 기기는 비업무용으로 전자파적합등록을 받은 기기이오니, 주거지역에서는 물론, 모든 지역에서 사용 하실 수 있습니다.

제조자 : 인텔 코오퍼레이션

B

Electrostatic Discharge

Overview

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place containers on a grounded surface before removing the contents.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an HP authorized reseller install the part.

NOTE: For more information on static electricity or assistance with product installation, contact your HP authorized reseller.

C

Specifications

NC7170 Gigabit Server Adapter Specifications

Table C-1: NC7170 Gigabit Server Adapter Specifications

Specification	Description
Network Controller Chipset	Intel® 82546EB Dual MAC/PHY
Bus Type	PCI-X/PCI
Bus Width	32- or 64-bit
Bus Speed (MHz)	33/66/100/133 MHz
Data Transfer Method	Bus Master DMA
On-board Memory	128 KB
Power Requirement	1600 mA @ 5V max
Data Transmission Rate	10 Full/10 Half, 100 Full/100 Half, 1000 Full
Standards Supported	IEEE 802.3ab, 802.3u, 802.3x , 802.1Q, 802.1p, 802.3ad (static configuration mode only)
Dimensions	6.6 x 4.8 inches (L x W), 16.5 cm x 12.2 cm (including bracket)
Connector and Distances	10BASE-T: Category 3, 4 or 5 UTP 100 Meters (328 feet) 100BASE-TX: Category 5 UTP 100 Meters (328 feet) 1000BASE-TX: Category 5 UTP 100 Meters (328 feet)
Interrupts Supported	Automatically configured
Temperature Range	Operating: 0°C to 55°C / 32°F to 131°F Storage: -65°C to 85°C / -85°F to 185°F

continued

Table C-1: NC7170 Gigabit Server Adapter Specifications *continued*

Specification	Description
Relative Humidity	Operating; 10% to 90% Storage: 5% to 95%
Agency Approvals	• FCC Class B • VCCI Class B • BSMI Class A • CISPR Class B • EN60950 • MIC Class B • EN 55022 Class B • EN55024-1 • UL • Canada UL • ICES-003 Class B

UTP Cable Specifications

To connect to the network, the NC7170 Server Adapter uses the following cable for 1000Base-T transmission.

- Category 5 UTP or better twisted-pair
- 22-26 AWG, 100Ω @ 1MHz
- EIA/TIA 568a or EIA/TIA 568b

Using UTP Category 5 Cable in Gigabit over Copper Installations

For Gigabit over copper installations, Category 5 UTP or better 1000Base-T cable must comply with the IEEE 802.3ab 1000Base-T standard. For new installations, Category 5e (enhanced Category 5) or better cable is recommended. Maximum distances for Gigabit over copper cable are 100 meters (328 feet).

RJ-45 Pinouts and Crossover Function

The Ethernet standard also specifies that each segment implement a crossover function to connect the transmitter of one device to the receiver of a device at the other end, and vice-versa. The crossover function may be implemented internally at the hub or switch, or externally through the twisted-pair media.

10/100 Straight-Through Pinouts

If the crossover function is implemented internally, the port is labeled MDI-X (Medium Dependent Interface-Crossover). When an MDI-X port is connected to an MDI port, the twisted pair media should be wired straight-through using the physical pinouts indicated in Table C-2.

Table C-2: 10/100 Pinouts Using Internal, Straight-Through Crossover

Pin	Function	Color Match	Function	Pin
1	TD+	White/Orange	TD+	1
2	TD-	Orange/White	TD-	2
3	RD+	White/Green	RD+	3
4		Blue/White		4
5		White/Blue		5
6	RD-	Green/White	RD-	6
7		White/Brown		7
8		Brown/White		8

Figure C-1 shows the straight-through 10/100 connector wiring to be used when the crossover function is implemented on the hub or switch.

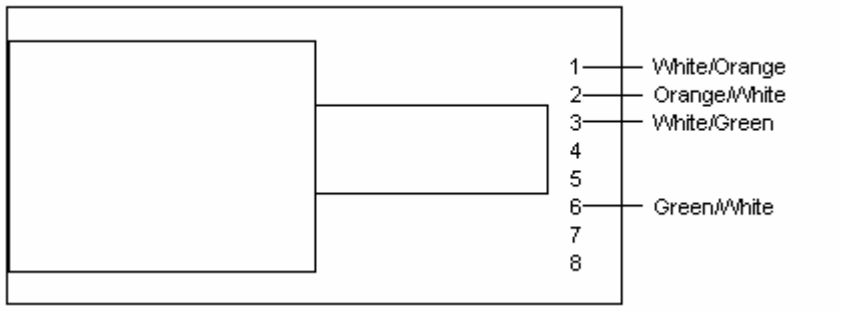

Figure C-1: 10/100 straight-through wiring for RJ-45 connector

10/100 Crossover Pinouts

When the crossover function is not provided within the hub or switch, you must implement the crossover through the twisted-pair media using the physical pinouts indicated in Table C-3.

Table C-3: 10/100 Pinouts Using External Crossover

Pin	Function	Color/Match	Function	Pin
1	TD+	White/Orange	RD+	3
2	TD-	Orange/White	RD-	6
3	RD+	White/Green	TD+	1
4		Blue/White		
5		White/Blue		
6	RD-	Green/White	TD-	2
7		White/Brown		
8		Brown/White		

Figure C-2 shows the correct wiring to use when the crossover function is implemented externally in the twisted-pair cabling.

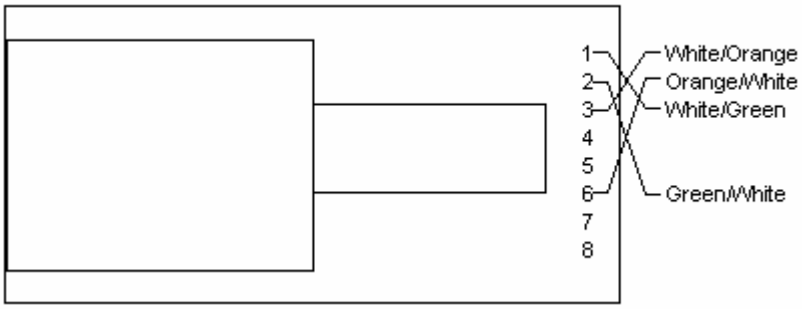

Figure C-2: 10/100 external crossover for RJ-45 connector

Gigabit over Copper Internal Straight-Through Pinouts

Unlike connections in which the crossover function is implemented internally at the hub or switch, the NC7170 Server Adapter provides its own automatic crossover function. This means you can wire twisted-pair media straight-through for adapter-to-hub, adapter-to-switch, or adapter-to-adapter connections using the pinouts shown in Table C-4.

NOTE: To operate at Gigabit speeds, all four pairs of wires must be terminated within the RJ-45 connector.

Table C-4: Gigabit over Copper Pinouts Using Internal Crossover

Pin	Function	Color Match	Function	Pin
1	BI_DA+	White/Orange	BI_DA+	1
2	BI_DA-	Orange/White	BI_DA-	2
3	BI_DB+	White/Green	BI_DB+	3
4	BI_DC+	Blue/White	BI_DC+	4
5	BI_DC-	White/Blue	BI_DC-	5
6	BI_DB-	Green/White	BI_DB-	6
7	BI_DD+	White/Brown	BI_DD+	7
8	BI_DD-	Brown/White	BI_DD-	8

Figure C-3 shows straight-through Gigabit over copper connector wiring to be used when the crossover function is implemented within the hub, switch, or adapter.

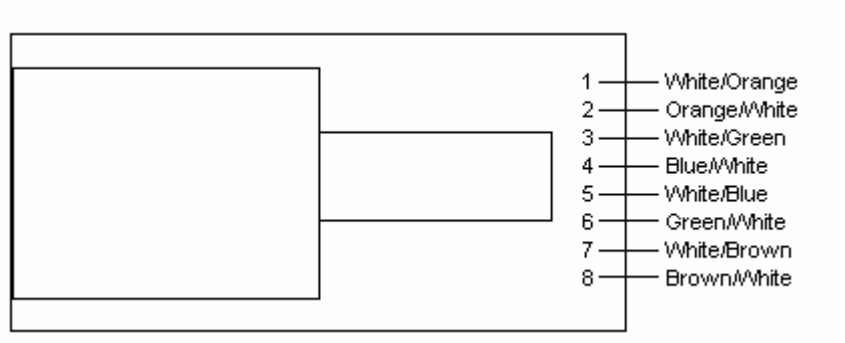

Figure C-3: Gigabit straight-through wiring for RJ-45 connector

Gigabit over Copper External Crossover Pinouts

When a crossover function is not provided by the adapter, hub or switch, you must implement it through the twisted-pair media using the physical pinouts shown in Table C-5.

Table C-5: Gigabit over Copper Crossover Pinouts

Pin	Function	Color Match	Function	Pin
1	BI_DA+	White/Orange	BI_DB+	3
2	BI_DA-	Orange/White	BI_DB-	6
3	BI_DB+	White/Green	BI_DA+	1
4	BI_DC+	Blue/White	BI_DD+	7
5	BI_DC-	White/Blue	BI_DD-	8
6	BI_DB-	Green/White	BI_DA-	2
7	BI_DD+	White/Brown	BI_DC+	4
8	BI_DD-	Brown/White	BI_DC-	5

Figure C-4 shows the correct Gigabit over copper wiring to be used when the crossover function is implemented externally in the twisted-pair cabling.

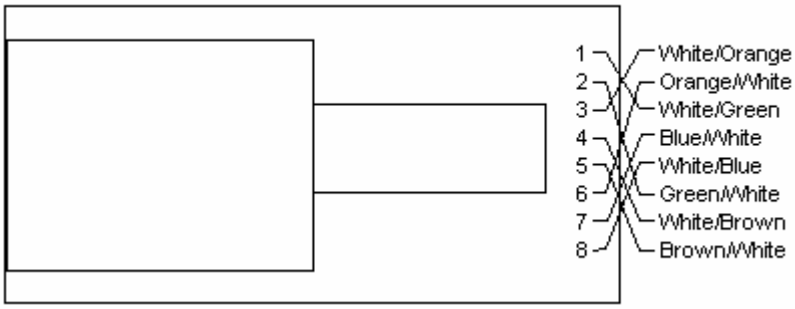

Figure C-4: Gigabit over copper external crossover for RJ-45 connector